

### **REMARKS**

This is in response to the Examiner's comments set forth in the Office Action of June 25, 2009. Claims 1-6, 8, 9 and 19-23 are pending. Claims 1-6, 8-9, 19, and 20-23 are amended.

Reconsideration is respectfully requested in light of the comments and amendments herein.

### **The Office Action**

Claims 1-6, 8-9 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/07902 (WO'902).

Claims 1-6, 8-9 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima et al, in view of WO'902.

### **The Claims Distinguish Patentably Over the References of Record**

As amended, independent claim 1 is directed to a single layered black chromate conversion coating for use on zinc and zinc alloy including trivalent chromium ions in a concentration of about 0.02M to about 0.2M, phosphorous anions, anions selected from the group of sulfate ions, nitrate ions, and combinations thereof, at least one transition metal or metalloid selected from groups III, IVa, Va, or VIII, an organic chelate selected from the group consisting of carboxylic acids, polycarboxylic acids, and combinations thereof. The concentration of the sulfate ions when present comprise about 0.02 to about 0.5M and a concentration of the nitrate ions when present comprise about 0.06 to about 0.6M. The organic chelate is present in a concentration of from about 0.02M to about 0.3M. The single layer of black chromate conversion coating is formed from an aqueous acidic solution. Neither WO'902 nor Oshima, individually or in combination, teach or suggest the subject invention as presently set forth in the subject claims.

Particularly, neither WO'902 nor Oshima teach or suggest a single layer black chromate conversion coating for use on zinc and zinc alloy. In the Response to Arguments presented in the Office Action of 6/25/09, the Examiner reasoned that Applicant's arguments were not persuasive because Applicant was not claiming a final coating layer. In light of the present amendments herein, Applicant asserts that the claims are now directed to an article including coating layer and therefore, the limitation that the coating comprises a single layer must be



considered by the Examiner.

WO'902 teaches a two layered anticorrosive black coating, which consists of two steps. First, a zinc alloy is treated with an acidic aqueous solution of  $\text{Cr}^{3+}$  and several complexing agents. In the next step, the zinc is rinsed, drained, and treated with an aqueous suspension of organic polymers, anticorrosive metallic oxides, and a black pigment. Therefore, WO'902 teaches of a coating comprising two independent and distinct layers, wherein the first layer must be passivated prior to application of the second layer. Therefore, even if the two layers of WO'902 collectively taught or suggested each of the components of the subject claims (which Applicant asserts does not), the fact that there are required steps between application of the two stages, i.e. rinsing and draining, it would not be obvious to one skilled in the art to combine the two layers into one.

Moreover, the Examiner argues that the anticorrosive solution used in the first stage of the process of WO'902 is significantly similar to the claimed aqueous acidic solution and the presence of phosphate, iron, cobalt, and/or nickel are recommended for forming a black coating by WO'902; therefore, one of ordinary skill would have expected that the anticorrosive solution in the first stage is capable of providing a black chromate conversion coating layer in a single layer. Applicant respectfully disagrees on the grounds that WO'902 is directed at a two-step process with a first stage consisting of treating an alloy of zinc by a  $\text{Cr}^{3+}$  solution, and a second stage consisting of treating the alloy of zinc passivate with an aqueous solution containing organic polymer, metallic oxide anticorrosive, and lastly a black pigment. (See top of page 2). Simply because WO'902 mentions that the addition of these elements is recommended for a black color fails to give one skilled in the art any motivation or teaching that would lead to the conclusion that the coating would be sufficient (color and function) after only one coating. This is especially true since the second step includes the addition of anticorrosive metallic oxides, which one skilled in the art would realize necessary in corrosion protection. Applicant asserts that WO'902 contains nothing that would suggest to one skilled in the art that providing only the first layer would result in a functional and improved coating layer. In fact, Applicant asserts that the two layers in WO'902 are essential and separating them as the Examiner suggests is clearly the use of impermissible hindsight.

Additionally, the Examiner argues that although WO'902 fails to disclose the claimed amounts of sulfuric and/or nitric acid, controlling the pH of the coating solution by adding



sulfuric acid and/or nitric acids as taught by WO'902 is a mechanism used to control quality and coating properties, and varying the concentration is routine optimization to maintain desired pH in the coating solution. Therefore, the Examiner asserts that it would have been obvious to one of ordinary skill to have varied the amount of sulfate and nitrate ions in the solution of WO'902 to achieve the desired pH. Applicant respectfully asserts that the Examiner's reasoning is improper. Primarily, Applicant asserts that simply because nitrate ions are used in WO'902 to control pH, does not mean that this is the case in the subject application. The subject coating comprises, along with nitrate and/or sulfate ions, phosphorous anions, organic chelates and transition metals that could each affect the pH level of the coating. Therefore, the concentration of each element is important, and it is the balance of the elements together determines the pH. As admitted by the Examiner, WO'902 currently teaches a pH range that overlaps the currently claimed range. Therefore, there is no motivation for one skilled in the art to adjust the sulfate and/or nitrate ion concentration to that disclosed in the subject claims.

Additionally, the Examiner asserts that Oshima teaches an aqueous coating solution free of hexavalent chromium that reads on the subject claims, except that Oshima fails to teach or suggest that the coating produces a black chromate coating. However, the Examiner argues that it would have been obvious to one of ordinary skill in the art to have incorporated the phosphate, Fe, Co, Ni and/or carbon black into the coating solution of Oshima to achieve a black coating. Applicant respectfully asserts that the Examiner's position is inconsistent with the teaching of the references. Particularly, both Oshima and WO'902 teach of adding any form of pigment or dye in what is essentially a topcoat (the second layer in WO'902 and the topcoat film in Oshima). Oshima teaches that the processing solution includes those components mentioned by the Examiner, with the balance of the solution being water. Oshima then sets forth that a topcoat may be applied to permit further improvement of the corrosion resistant film. The topcoat may include a dye to pigment the topcoat film. As stated more thoroughly above, WO'902 additionally teaches of adding pigment to the second layer only. Therefore, even if it was proper to combine WO'902 and Oshima, the resultant would be a two-layer coating with only the topcoat including the black pigment.

The Examiner asserts that WO'902 teaches phosphate, Fe, Co and Ni are all contributors to the resulting black coating, and therefore it would have been within one of ordinary skill in the art to have incorporated some or all of the ions into the coating solution of Oshima in order to



achieve a black coating. Applicant asserts that if one skilled in the art was faced with the teachings of WO'902 and Oshima, any elements that would be added for pigmentation purposes would be added to the topcoat, not the processing solution. Therefore, the Examiner's assertion that one skilled in the art would incorporate the elements into the coating solution is against the present teachings.

Further, the Examiner continues to maintain that the first layer of WO'902 is capable of producing black chromate conversion coating layer, on the grounds that WO'902 does not teach that the layer is not black. Applicant respectfully disagrees and asserts that although WO'902 does not explicitly teach that the first layer is not black, WO'902 does state multiple times that a black pigment is added last, or eventually (See page 1, 4<sup>th</sup> paragraph and page 2, 3<sup>rd</sup> line). Additionally, each time the black pigment is mentioned, it is in reference to the second layer. Although WO'902 does indicate that other elements (i.e. iron, cobalt, phosphate and nickel) may contribute to the black color, WO'902 specifically states that "the black uniform color is by the addition of black pigments. Or other pigments." (See page 3, second paragraph). Anytime pigments are mentioned in WO'902 they are in reference to the second layer. Accordingly, Applicant asserts that the Examiner is improperly reading more into the teaching than is contained therein.

In light of at least the above, it is clear that the teachings of WO'902 and Oshima do not teach or suggest the present invention as taught in independent claims 1, (along with claims 2-6 and 8-9 that depend therefrom) 19, and 20 (along with claims 21-23 that depend therefrom). Accordingly, Applicant respectfully requests that the rejection be withdrawn.



**CONCLUSION**

For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-6, 8-9, and 19-23) are now in condition for allowance.

Respectfully submitted,

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Date



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